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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/027,476	12/21/2001	Jimmy Kuo Chen	276440-21	9965

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EXAMINER	
NGUYEN, DONGHAI D	

ART UNIT	PAPER NUMBER
3729	

DATE MAILED: 01/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/027,476	CHEN, JIMMY KUO	
	Examiner	Art Unit	
	Donghai D. Nguyen	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 16-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 16-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-11, 13-16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,150,186 to Chen et al in view of US Patent 4,983,804 to Chan et al.

Regarding claims 1, 16, and 18-20, Chen et al disclose a method for heat treating a plurality of conductive interconnect structures attached to a substrate, the method comprising the steps of: providing a contactor (Figs. 2 or 3) comprising a substrate (semiconductor wafer 202) and a plurality of conductive interconnect structures (wires/springs 204/208/212) each of the interconnect structures is attached to a terminal on the substrate and comprises a contact tip disposed away from the substrate (See Figs. 2-3); placing the contactor in heating field; maintaining the contactor in the field heating field until each of the interconnect structures obtains a defined heat-treatment temperature substantially greater than an ambient temperature for a predetermined period of time sufficient to permanently improve a mechanical operating property of the interconnect structure (Fig. 1 and Abstract, lines 1-3); removing the contactor from the heating field (it is inherent that the contact be removed from heating field to room temperature for cooling down); and cooling the interconnect structures to the ambient temperature (Col. 3, lines Col. 11, lines 39-44).

Chen et al is silent regarding how the contactor is subjected to heat treatment. Chan et al teach the step of placing an electrical device (Figs. 2/4) in an oscillating electromagnetic field for heating the interconnect structures (30-35) without substantially heating the substrate (Col. 2, lines 46-48). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Chen et al's method for heat treatment the contact by placing the contactor in the oscillating electromagnetic field as taught by Chan et al for heating the interconnect structures without substantially heating the substrate.

Regarding claims 2-3, Chen et al disclose the interconnect structures are comprised of a ferromagnetic material which is a nickel-cobalt alloy (Col. 6, lines 1-19).

Regarding claims 4-7 and 10-11, Chen et al do not teach the step of tuning the oscillating electromagnetic field between a pair of plates (claim 7), to a resonant frequency of a field generator circuit (claim 10), and to frequency about 10 MHz-15MHz (claim 11) for selectively heating the ferromagnetic material (claim 4) and obtaining the heat treatment temperature greater than 800° C and 1300° C (claims 5 and 6). Chan et al disclose tuning the oscillating electromagnetic field between a pair of plates (23, 24), to a resonant frequency of a field generator circuit, and to frequency about 10 MHz-15MHz that selectively heat the ferromagnetic material and obtain the heat treatment temperature greater than 800° C and 1300° C (see Figs. 3, 5-12) for preventing damage to other sensitive component/substrate (Col. 3, lines 58-60). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the Chan et al heating method onto the method invention of Chen et al for benefit of preventing damage to the associated component/substrate.

Regarding limitation of claims 8 and 9. It would have been an obvious matter of design choice to choose coil element i.e., size, shape, and configuration, since Applicant has not disclosed that the claimed specifics coil shape including copper tube or hairpin coil for generating the oscillating electromagnetic field would solve any stated problem or for any particular purpose and it appears that the invention would perform equally well with the coil element (23/24) of Chan et al reference.

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al in view of Chan et al as modified and applied above, and further in view of US Patent 5,340,537 to Barrett.

Chen et al/Chan et al as modified and relied upon above do not teach the specific step of applying a heat-indicating paint to the plurality of microelectronic structures prior to the maintaining step as recited in claim 12. Barrett teaches the step of applying a heat-indicating paint to the plurality of microelectronic structures for measuring a temperature (col. 3, lines 9-17). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the teaching as taught by Barrett onto the modified method invention of Chen et al in order to facilitate the fabrication process including measuring and controlling of the temperature.

4. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al in view of Chan et al as modified and applied above, and further in view of US patent 5,476,211 to Khandros.

Chen et at/Chan et al as modified and relied upon above do not teach the associated contactor comprising an interposer and the conductive interconnect structures are disposed on the opposing sides of the substrate as recited in claim 17. Khandros discloses the contactor (59) comprising an interposer (Figs. 18-21) and the conductive interconnect structures are disposed on the opposing sides of the substrate for electrically interconnecting between two substrates of surfaces of substrate (col. 15, lines 65-66 and Col. 16, lines 8-16). It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the contactor having the configuration requirement as describe above as taught by Khandros onto the modified method of Chen et al in order to obtain an interconnecting structure between two surfaces.

Response to Arguments

5. Applicant's arguments filed December 03, 2005 have been acknowledged but they are not persuasive. The argument ("Remark" page 6) is considered to be met and inclusive in view of the rejections set forth above.

6. Applicant's arguments with respect to claims 1-12 and 16-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (571)-272-4566. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (571)-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN
January 11, 2005

MINH TRINH 1/12/05
PRIMARY EXAMINER